Written by Gary R. Burger, Stevenson Memorial Hospital
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Most end users think OEMs take particular pains to design things that last. That's true in most cases, but not all. Will doubling up or wearing dual protection-*an earmuff in addition to earplugs* - provide added protection against extreme noise levels? The answer is yes, according to a recently released Sound Source™ bulletin from the Bacou-Dalloz Hearing Safety Group-*but maybe not as much as you thought*.

The new bulletin, Sound Source #11a, "Dual Protection," is authored by audiologist Brad Witt, the Audiology and Regulatory Affairs Manager for the Hearing Safety Group. He notes that dual protection is not required by OSHA regulations for general industry in the U.S., but is required for mining operations governed by the Mine Safety & Health Administration (MSHA) for noise exposures over 105 dBA (8-hour time-weighted average). Similarly, NIOSH recommends dual protection for any exposures over 100 dBA, and some companies require it for employees with progressive noise-induced hearing loss despite normal protective measures.

There are, however, risks associated with dual protection. "Using earplugs and earmuffs concurrently seriously isolates the wearer," Witt writes, "so it is warranted only in extreme noise levels." He also suggests that dual protection may be overused. "When a high attenuation earplug or earmuff is properly fitted and the user is motivated to use it correctly, some hearing professionals say the need for dual protection is rare."

Obtaining maximum benefit

So how much protection will doubling up provide? "That depends on the fit," says Witt, "but, it is not simply the combined ratings of the earplug and earmuff. There is a ceiling effect that limits the amount of combined protection. Even if wearing a perfectly fitted earplug and earmuff with ideal attenuation, we would still hear sound transmitted through our bodies and bones to the inner ear."

The maximum amount of attenuation that can be attained by most people is 35-50 dB, depending on the frequency of the sound.

As for a rule of thumb for estimating the effects of dual protection, OSHA recommends adding 5 dB to the NRR of the higher rated device. "But this," says Witt, "sacrifices some accuracy. An earmuff typically adds about 4 dB to the NRR of a well-fitted foam earplug, and about 7 dB to a well-fitted pre-molded earplug." He also says that an earmuff with moderate attenuation provides the same effect as a high-attenuation earmuff when either is worn over a well-fitted earplug.

According to Witt, the key to obtaining maximum benefit from dual protection is proper fit-especially the fit of the earplug. When a poorly fitted earplug is worn with an earmuff, the resulting dual protection is little more than the earmuff alone.

About Bacou-Dalloz
Sound Source, a free periodic publication of the Bacou- Dalloz Hearing Safety Group, addresses questions and topics relating to hearing conservation and hearing protection. Bacou-Dalloz manufactures and markets a comprehensive range of safety products designed to protect people from hazards in the workplace. The Group specializes in head protection equipment (eye and face, respiratory and hearing protection), body protection equipment (clothing, gloves and footwear) and fall protection equipment. These products are sold through a worldwide network of distributor partners for use in all sectors (construction, manufacturing, telecommunications, homeland security, petrochemicals, medical, public services, etc.)

Bacou-Dalloz Hearing Safety Group
San Diego, CA

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